

I. General Considerations

- A. Defibrillation and CPR take precedence over all other treatments in medical cardiac arrest. Although high quality CPR improves cardiac output in arrest, EMS providers should not perform CPR while an AED is charging. An AED evaluates the rhythm while it is charging and may abort a shock because of interference with the rhythm from CPR.
 - B. When ineffective cardiac activity exists, perfusion is lacking and irreversible brain damage will occur in normothermic patients within 4 to 6 minutes.
 - C. CPR should not be interrupted any longer than necessary until an effective pulse is reestablished.
 - D. The prime concerns in the pediatric cardiac arrest are airway management and oxygenation. Ventricular fibrillation (VF), although not common in children, does occur occasionally and sometimes responds to a shock from an AED. When an EMS provider encounters a child older than 1 year, the provider should apply an AED to the patient's chest and shock the patient as advised. If a pediatric adapter and pads are available, the provider should use them, but they are not required.
 - E. Some patients may take gasping breaths (agonal respirations) which are not adequate respirations. Do not confuse this with adequate ventilation.
 - F. Traumatically induced cardiac arrest is quite different from "medical" cardiac arrest. Trauma arrest is generally the result of volume loss and shock. Consequently, the priority for treatment is routinely rapid transport. If defibrillation is indicated and will not delay transport, it should be used.
 - G. Defibrillators that are FDA approved and acceptable to the EMS District Medical Advisor may be used.
 - H. A biphasic AED should be programmed to deliver the dose at which it has proved effective in eliminating VF. Depending on the device, this may vary from 120 joules to 200 joules for the initial shock. Subsequent doses should be the same or greater. A monophasic AED should be programmed to deliver 360 joules for each shock.
 - I. If an EMS provider uses an AED that has not been (or cannot be) reprogrammed to deliver single shocks, the provider should follow current guidelines for ventilation and compression rates, depth and ratios, but follow the prompts of the AED regarding timing and sequence of shocks. This should minimize confusion and result in acceptable patient outcomes.
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II. History

Perform a focused history and physical exam with particular attention to:

- A. What was the time of onset of the arrest?
 - B. Does the patient have an apparently valid Do Not Resuscitate (DNR) order or identification?
 - C. What symptoms immediately preceded the arrest? (e.g., chest pain, lightheadedness, trouble breathing, etc).
 - D. What medications is the patient taking?
 - E. What has been done for the patient since the arrest? Has the patient received effective CPR and for how long?
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III. Physical Examination

- A. Perform an initial assessment with particular attention to:
 - Verifying absence of effective respirations.
 - Verifying absence of a pulse (e.g., carotid in the adult, carotid or femoral in child and brachial or femoral in infant).
- B. Perform a brief history and physical exam to determine if there are unsurvivable injuries,

rigor mortis or discoloration of the skin at the lowest parts of the body.

Paramedic

- C. Determine the cardiac rhythm.
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IV. Treatment (see appropriate protocol)

{Notes: If the patient meets criteria for “Dead on the Scene”, refer to that protocol.

If the patient is in cardiac arrest with major multiple system trauma, refer to that protocol.

If the patient has an apparently valid Do Not Resuscitate (DNR) order or identification, see the Do Not Resuscitate protocol.}

Basic

- A. **EMT-Basics** should follow the Automated External Defibrillation (AED) sequence for patients more than 1 year old.
- B. Establish an airway, maintain as indicated, suction as needed.
- C. Perform CPR. Avoid hyperventilating the patient. Evidence strongly suggests hyperventilation is harmful unless there is a clear, compelling reason to institute it. Good ventilations at the recommended rate (10 – 12 in the adult) are more beneficial than faster ventilations.
- D. Administer high concentration oxygen.

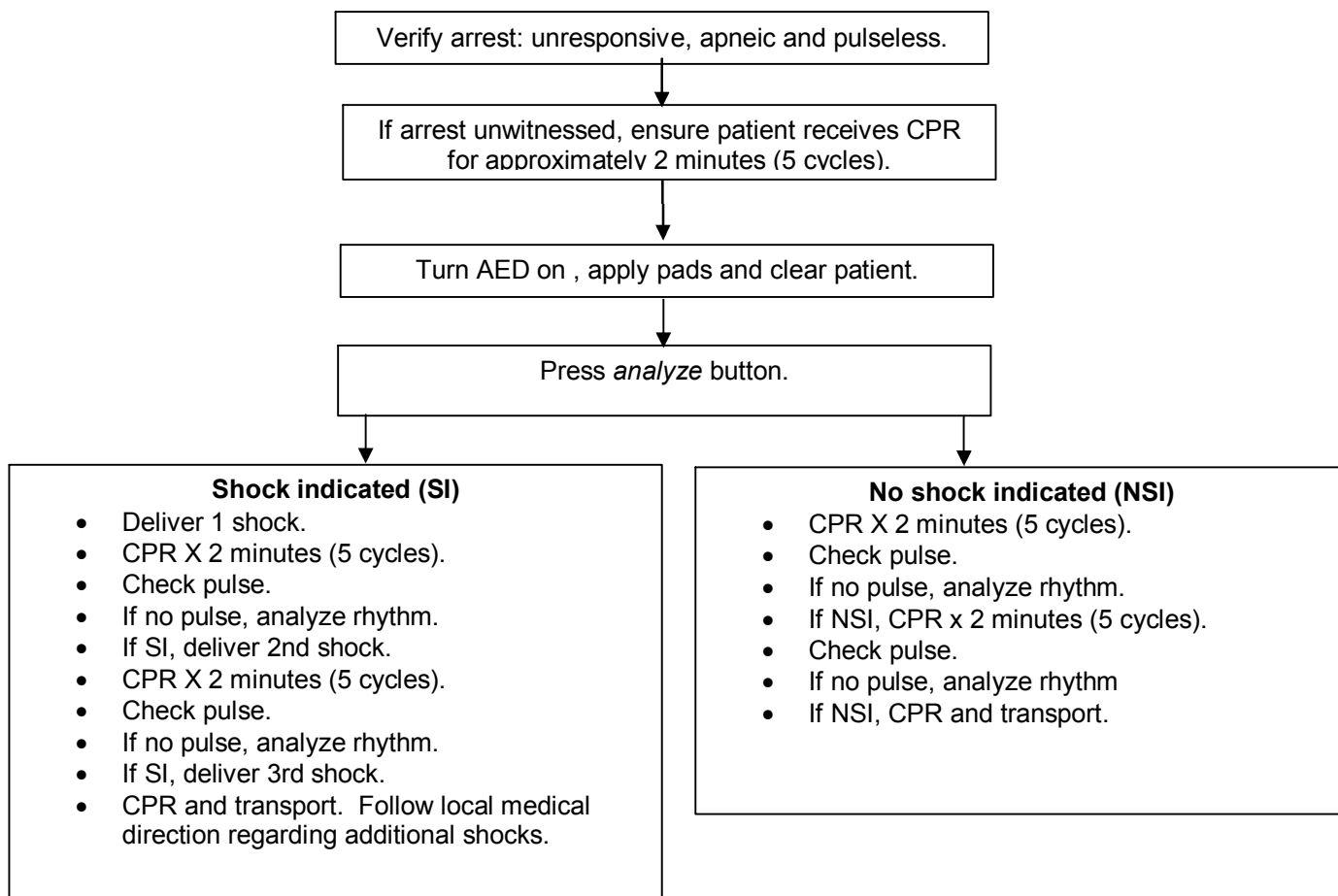
Intermediate

- E. **If the patient remains in respiratory arrest**, perform advanced airway management.
- F. Secure IV access.

Paramedic

- G. Shock persistent ventricular fibrillation (VF) with the energy level at which the defibrillator has proved effective in eliminating VF. Perform CPR when the patient is not being shocked or assessed.
- H. Assess and monitor the cardiac rhythm; treat arrhythmias/dysrhythmias per applicable protocols. Consult medical direction regarding pediatric medication doses.
- I. Intubate the patient.

CARDIAC ARREST TREATMENT SEQUENCE WITH AUTOMATED EXTERNAL DEFIBRILLATION



Notes:

- Whenever a no shock indicated (NSI) message appears, perform CPR for 2 minutes (5 cycles).
- If the patient regains a pulse, check breathing. Ventilate with high-concentration oxygen, or give oxygen by nonrebreather mask as needed.
- If you initially shock the patient and then receive an NSI message before giving three shocks, follow the steps in the above right-hand column.
- If you initially receive an NSI message and then on a subsequent analysis receive a shock indicated (SI) message, follow the steps in the above left-hand column.
- Occasionally you may need to shift back and forth between the two columns. If this happens, follow the steps until one of the indications for transport (described below) occurs.
- Transport as soon as one of the following occurs:
 - You have administered three shocks.
 - You have received three consecutive NSI messages (separated by two minutes of CPR).
 - The patient regains a pulse.
- If you shock the patient out of cardiac arrest and he arrests again, start the sequence of shocks from the beginning.

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